

REMARKS

This amendment is in response to the Official Action mailed on June 22, 2004. Claims 1 to 5 and 7 to 10 have been amended. Claim 6 has been canceled. Claims 11 to 22 are new. Thus, claims 1-5 and 7-22 are currently pending.

In the Official Action, the Examiner has objected to the drawings under 37 C.F.R. 1.83(a), as not showing every feature of the invention specified in the claims. Specifically, the Examiner objects to the "placement of a flow meter at a point in the flow stream after particulates are added to the fluid stream" limitation in claim 4. In response, Figure 1 has been amended to show the flow meter 30 alternatively connected to the discharge from blender 20. Support for the amendment can be found in the description at page 6, lines 18 to 21. Similarly, the paragraph on page 6, line 18 has been amended to more particularly describe the amendment to Figure 1. This amendment does not constitute new matter, but rather more clearly points out subject matter which was clearly supported in the application as originally filed.

In paragraph 3 of the Official Action, the Examiner has also objected to the disclosure because of several informalities. Several paragraphs of the specification have been amended in response to the matters raised in paragraph 3 of the Official Action. It is believed that the specification has thus been properly amended to overcome Examiner's objections.

With regard to the claims, the Examiner has objected to claims 5 and 6 because of several informalities. Specifically, the Examiner objects to the phrase "of any" in claims 5 and 6. This phrase has been deleted in accordance with Examiner's suggestions. Thus, this objection should be removed.

The Examiner has also rejected claims 1-7 and 9 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,441,340 to Cedillo et al. ("Cedillo") in view of U.S. Patent No. 3,906,780 to Baldwin ("Baldwin") and claim 8 and 10 under 35 U.S.C. §103(a) as being unpatentable over Cedillo in view of Baldwin, and in further view of U.S. Patent No. 6,118,104 to Berkcan et al. ("Berkcan"). These rejections are discussed below.

The Examiner has rejected several of the claims in this application as being unpatentable over Cedillo in view of Baldwin. Cedillo discloses a system for determining the concentration of particulates in a slurry using a nuclear densiometer and using that measurement to adjust the addition of particulates to the blender to maintain particulate concentration at a predetermined value. The Examiner correctly notes that Cedillo fails to disclose the use of an acoustic sensor to determine the rate of particulate flow and the concentration of particulate in

the fluid stream. The Examiner, however, asserts that Baldwin teaches the use of an acoustic sensor positioned at the outer surface of the conduit to detect the presence of particulate material in a fluid stream (emphasis added), and thus, the Examiner argues that it would have been obvious to modify Cedillo to incorporate an acoustic sensor as taught by Baldwin. Particularly, the Examiner asserts that Baldwin's sensor has a primary resonant frequency, in one of its modes, that provides a proper response characteristic necessary for the detection of particulate material.

Applicant agrees with the Examiner's characterization of Baldwin's teachings that his system is for the purpose of merely "detecting" the presence of particulates. Baldwin's system in this regard is intended primarily for monitoring produced fluids for the presence of particulates in excess of a threshold quantity to avoid damage to downstream operations and equipment that might result if particulates exceed this threshold. Baldwin therefore is concerned with detection only. Baldwin lacks any enablement whatsoever with respect to quantitative measurement, and therefore, there is no motivation given to the skilled technician to combine Baldwin with Cedillo. Cedillo uses a nuclear densiometer, which is a well known device for accurately measuring absolute densities. An acoustic sensor by itself cannot simply be substituted for a densiometer and still provide the user with a quantitative measurement of density or concentration. As a result, the skilled person wanting to use a system as taught by Cedillo but without a densiometer, given the disadvantages of such a device described by the applicant in the specification, and looking for a substitute, would not find an answer in Baldwin. That person might note Baldwin's suggestion that an acoustic sensor could be used for quantitative measurements, but in the absence of an enabling teaching, would have to virtually invent such a method, which is in fact what the applicant has done and claimed in the present application.

As amended, claim 1 recites that the output from the acoustic sensor is adjusted to filter out acoustic noise unrelated to the particulate, and is further adjusted "for some or all of fluid, fluid flow, particulate, conduit and sensor characteristics". This is an important distinction over Baldwin, because Baldwin is simply monitoring produced fluids, characteristics such as fluid density, viscosity, particulate density and even the flow rate are unknown commodities. Without these parameters, making accurate computations is all but impossible, and Baldwin does not address these shortcomings anywhere in his disclosure, especially, in view of the fact

that he is concerned with detection only and not quality control. It is respectfully submitted that amended independent claim 1 clearly distinguishes over Cedillo and Baldwin.

Independent claim 7 has been amended to indicate that the flow meter measures the rate of flow of the fluid "before or after the fluid is mixed with the particulate", and that the acoustic sensor is located at a bend in the fluid line for measuring the "noise of particulate impacting said fluid line at said bend and producing a signal reflecting the amount of said noise". As discussed above, Cedillo discloses the use of a flow meter, and Baldwin discloses the use of an acoustic sensor for detection purposes, but the two references do not disclose this combination of elements, and for the reasons discussed above, these two references cannot be combined to provide the claimed solution. Similar amendments have been made to independent claim 9 which is also felt to distinguish over the art for the reasons discussed above. It is respectfully submitted that amended independent claims 7 and 9 clearly distinguish over Cedillo and Baldwin.

New claims 11 to 22 are directed towards the use of a digital signal processor to produce a digital signal raw output, and to the formulae used to calculate the particulate rate and particulate concentration. Support for these claims can be found in the specification on pages 8, 9, 10 and 11. It is respectfully submitted that these elements are also not disclosed in the prior art and represent additional patentable subject matter.

Therefore, it is respectfully submitted that currently pending independent claims 1, 7, and 9 are in condition for allowance, and such action is therefore respectfully submitted. Dependent claims 2-5, 8 and 10-22 should thus also be allowed, as they properly depend from the aforementioned allowable independent claims. It is noted that the further rejections of claims 8 and 10 need not be addressed as these claims properly depend upon allowable independent claims 7 and 9, respectively.

As it is believed that all of the rejections set forth in the Official Action have been fully met, favorable reconsideration and allowance are earnestly solicited.

If, however, for any reason the Examiner does not believe that such action can be taken at this time, it is respectfully requested that he/she telephone applicant's attorney at (908) 654-5000 in order to overcome any additional objections which he might have.

Application No.: 10/616,142

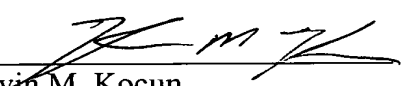
Docket No.: MOFFAT 3.0-032

If there are any additional charges in connection with this requested amendment, the Examiner is authorized to charge Deposit Account No. 12-1095 therefor.

Dated: December 22, 2004

Respectfully submitted,

By


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IN THE DRAWINGS

Please replace the sheet including Figure 1 with the replacement sheet including Figure 1 submitted herewith.

Attachment: One Replacement Sheet
One Annotated Sheet Showing Changes

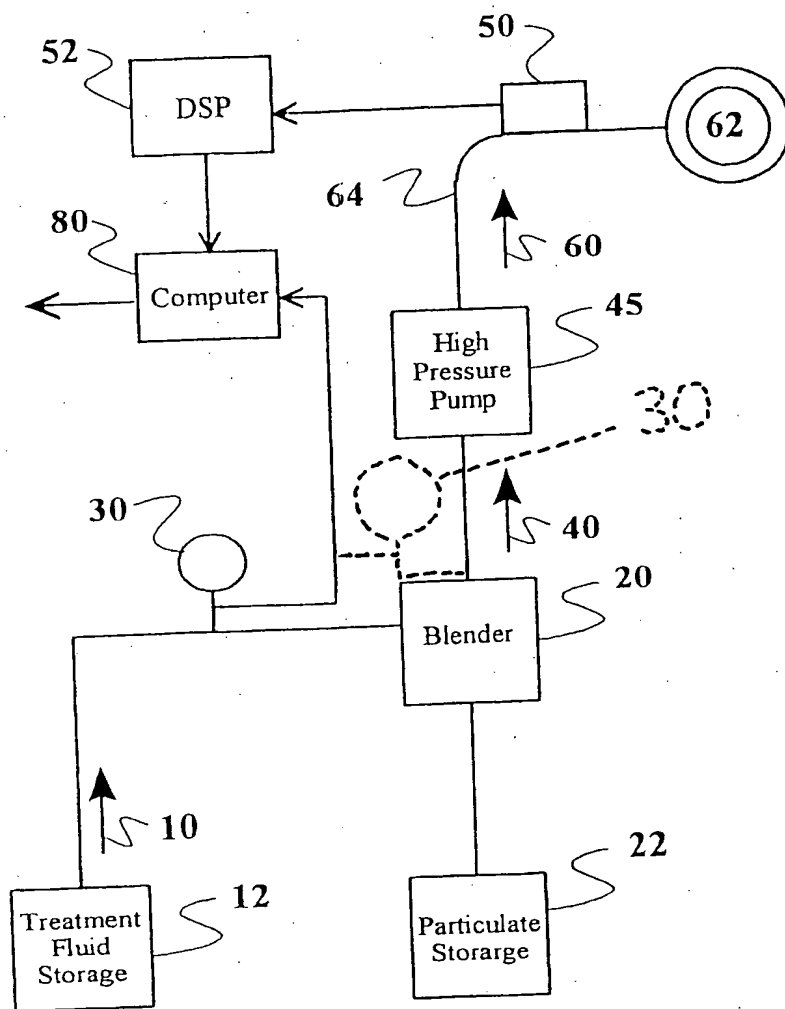


FIG. 1